
**Underground mining machines —
Mobile extracting machines at the face
— Safety requirements for shearer
loaders and plough systems**

*Machines d'exploitation de mines et carrières souterraines —
Machines mobiles d'abattage de front de taille — Exigences de
sécurité imposées aux haveuses à tambour(s) et aux rabots*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 List of significant hazards	3
5 Safety requirements and/or protective measures	5
5.1 General.....	5
5.2 Contact surfaces.....	5
5.2.1 Sharp corners and edges.....	5
5.2.2 Hot surfaces.....	6
5.3 Stability.....	6
5.4 Control devices and systems.....	7
5.4.1 General requirements.....	7
5.4.2 Safety and reliability of control systems.....	8
5.4.3 Design of control systems.....	8
5.4.4 Failure of power supply.....	10
5.4.5 Remote control.....	10
5.4.6 Radio control.....	10
5.4.7 Automatic control.....	11
5.4.8 Measures to prevent inadvertent movements.....	12
5.5 Falling objects and ejected material.....	13
5.6 Dust control.....	13
5.6.1 General.....	13
5.6.2 Dust reduction.....	13
5.6.3 Dust suppression.....	13
5.7 Noise.....	13
5.7.1 General.....	13
5.7.2 Noise reduction at the source at the design stage.....	14
5.8 Electrical requirements.....	14
5.8.1 General.....	14
5.8.2 Control of electrical power supply.....	14
5.8.3 Monitoring of circuits.....	14
5.8.4 Cables.....	15
5.8.5 Bonding.....	15
5.8.6 Lighting.....	15
5.9 Mechanical requirements.....	15
5.9.1 General.....	15
5.9.2 Chains.....	15
5.9.3 Gearboxes.....	16
5.10 Hydraulic systems and water systems.....	16
5.10.1 Hydraulic systems.....	16
5.10.2 Water systems.....	16
5.11 Fire protection.....	17
5.12 Load attachment points.....	17
5.13 Maintenance and repair.....	17
6 Verification of the safety requirements and/or protective measures	18
7 Information for use	19
7.1 General.....	19
7.2 Signals and warning devices.....	19
7.3 Accompanying documents.....	20
7.3.1 General.....	20

ISO 19225:2017(E)

7.3.2	Information for transportation, handling and storage	20
7.3.3	Information for assembly and commissioning	20
7.3.4	Information about the machine	20
7.3.5	Information for operational use	20
7.3.6	Information on maintenance and repairs	21
7.3.7	Information for decommissioning, dismantling and disposal	21
7.3.8	Information for emergencies	22
7.4	Marking	22
Annex A (normative) Noise test code		23
Bibliography		26

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html

The committee responsible for this document is ISO/ TC 82, *Mining*.

Introduction

This document is a type-C standard as stated in ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type C standard.

The machines concerned work with tools for cutting minerals such as coal, ore, salt and surrounding rock, at a fixed or variable height and are guided on armoured face conveyors or their attachments. Shearer loaders have built-in haulage systems. They can be directly operated by one or more drivers or be remotely or program controlled. Plough systems are remotely controlled. Wireless remote control systems of shearer loaders are used in the immediate environment of the machines.

Underground mining machines — Mobile extracting machines at the face — Safety requirements for shearer loaders and plough systems

1 Scope

This document specifies safety requirements to minimize the hazards listed in [Clause 4](#) that can occur during the assembly, use, maintenance, repair, decommissioning, disassembly and disposal of shearer loaders and plough systems when used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer, in underground mining.

This document does not cover any hazards resulting from explosive atmospheres. Requirements for explosive atmospheres can be found in ISO/IEC 80079-38.

This document is not applicable to machines that are manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3457:2003, *Earth-moving machinery — Guards — Definitions and requirements*

ISO 3864-3, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 7731:2003, *Ergonomics — Danger signals for public and work areas — Auditory danger signals*

ISO 9244, *Earth-moving machinery — Machine safety labels — General principles*

ISO 9355-1, *Ergonomic requirements for the design of displays and control actuators — Part 1: Human interactions with displays and control actuators*

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 12922, *Lubricants, industrial oils and related products (class L) — Family H (Hydraulic systems) — Specifications for hydraulic fluids in categories HFAE, HFAS, HFB, HFC, HFDR and HFDU*

ISO 13732-1, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces*

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13850, *Safety of machinery — Emergency stop function — Principles for design*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*